



## CASE STUDY

### ASSIGNMENT

### SOLAR WATER HEATING PROJECT

#### Assignment 2 : Commercial Domestic Hot Water / Boston, MA

#### DESCRIPTION OF ASSIGNMENT

You have been hired by the board of a co-op to determine the feasibility of a solar hot water system for their condominium in Boston.

#### SITE INFORMATION

You have following information: The building is in Boston at latitude 42.4°. The condominium contains 28 units with roughly 37 inhabitants and has a laundry room with 3 washing machines. Hot water is produced by a stand-alone direct-fired storage tank water heater burning natural gas at an efficiency of 70%. The temperature of the hot water is 48.9°C/120°F. The board would like to have an annual solar fraction of 70% using glazed collectors made by Stiebel Eltron. Due to the roof layout, you have to mount the collectors at 20° west of south. The collector angle is your choice. This is a closed loop system using propylene glycol as anti-freeze protection operating all year round.

#### FINANCIAL INFORMATION

The total installed system cost is at \$150/ft<sup>2</sup> of collector area. This includes material cost as well as labor. The current gas price is \$1.80/therm. The client assumes that they will successfully apply for the National Grid Economic Redevelopment Program (\$8/therm), that the system is eligible for the Massachusetts state income tax deduction (assuming a tax rate of 9.5%), and eligible for the Federal Tax Credit of 30%.